



US009191694B2

(12) **United States Patent**  
**Casagrande**

(10) **Patent No.:** **US 9,191,694 B2**

(45) **Date of Patent:** **\*Nov. 17, 2015**

(54) **AUTOMATICALLY RECORDING  
SUPPLEMENTAL CONTENT**

USPC ..... 386/296, 291, 297, 298, 323, 326  
See application file for complete search history.

(71) Applicant: **EchoStar Technologies, L.L.C.**,  
Englewood, CO (US)

(56) **References Cited**

U.S. PATENT DOCUMENTS

(72) Inventor: **Steven Michael Casagrande**, Castle  
Pines, CO (US)

4,706,121 A 11/1987 Young  
4,723,246 A 2/1988 Weldon, Jr.

(Continued)

(73) Assignee: **ECHOSTAR UK HOLDINGS  
LIMITED**, Steeton (GB)

FOREIGN PATENT DOCUMENTS

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 244 days.

CN 101 404 780 A 4/2009  
CN 101978690 A 2/2011

(Continued)

This patent is subject to a terminal dis-  
claimer.

OTHER PUBLICATIONS

U.S. Appl. No. 13/856,752, filed Apr. 4, 2013 Notice of Allowance  
mailed Feb. 10, 2015, 20 pages.

(Continued)

(21) Appl. No.: **13/888,012**

(22) Filed: **May 6, 2013**

*Primary Examiner* — Robert Chevalier

(74) *Attorney, Agent, or Firm* — Kilpatrick Townsend &  
Stockton LLP

(65) **Prior Publication Data**

US 2013/0243401 A1 Sep. 19, 2013

**ABSTRACT**

**Related U.S. Application Data**

(63) Continuation of application No. 13/215,702, filed on  
Aug. 23, 2011, now Pat. No. 8,441,170.

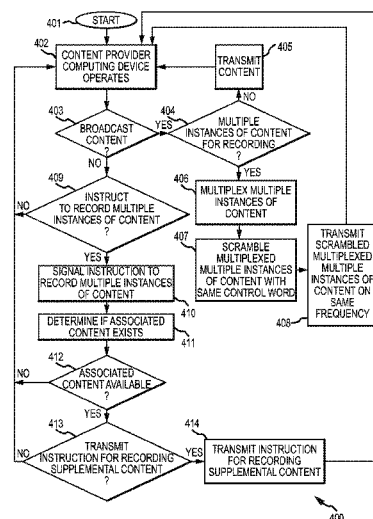
(51) **Int. Cl.**  
**H04N 5/76** (2006.01)  
**H04N 21/433** (2011.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **H04N 21/4334** (2013.01); **H04N 9/8227**  
(2013.01); **H04N 21/8133** (2013.01); **H04N**  
**21/8549** (2013.01)

(58) **Field of Classification Search**  
CPC ..... H04N 9/8227; G04N 21/8549; G04N  
21/8133; G04N 21/4334

A content provider transmits instructions to a content receiver to record multiple instances of content. The instances of content are included in the same frequency band of a broadcast transmitted by the content provider via a first communication link and scrambled utilizing the same control word. The content provider determines to supplement the multiple instances of content and transmits an instruction to record a supplemental instance of content from a second content provider via a second communication link. The content receiver receives the instructions and accordingly receives, descrambles, and stores the multiple instances of content and the supplemental instance of content. In some implementations, the first communication link may be a satellite communication link and the second communication link may be a different type of communication link such as a terrestrial broadcast communication link and/or an Internet protocol communication link.

**20 Claims, 4 Drawing Sheets**



(51)	Int. Cl.		2002/0097340	A1	7/2002	Takagi et al.	
	H04N 9/82		(2006.01)	2002/0141431	A1	10/2002	Tripathy
	H04N 21/81		(2011.01)	2002/0144266	A1	10/2002	Goldman et al.
	H04N 21/8549		(2011.01)	2002/0152299	A1	10/2002	Traversat et al.
				2002/0164147	A1	11/2002	Suda
(56)	References Cited		2002/0168178	A1	11/2002	Rodriguez et al.	
			2002/0174430	A1	11/2002	Ellis et al.	
U.S. PATENT DOCUMENTS			2002/0188943	A1	12/2002	Freeman et al.	
			2003/0026423	A1	2/2003	Unger et al.	
			2003/0078930	A1	4/2003	Surcouf et al.	
			2003/0110514	A1	6/2003	West et al.	
			2003/0152360	A1	8/2003	Mukai et al.	
			2003/0156826	A1	8/2003	Sonoda et al.	
			2003/0177495	A1	9/2003	Needham et al.	
			2003/0200548	A1	10/2003	Baran et al.	
			2003/0208763	A1	11/2003	McElhatten et al.	
			2004/0001087	A1	1/2004	Warmus et al.	
			2004/0015992	A1	1/2004	Hasegawa et al.	
			2004/0015999	A1	1/2004	Carlucci et al.	
			2004/0103428	A1	5/2004	Seok et al.	
			2004/0128682	A1	7/2004	Liga et al.	
			2004/0162871	A1	8/2004	Pabla et al.	
			2004/0218905	A1	11/2004	Green et al.	
			2004/0242150	A1	12/2004	Wright et al.	
			2004/0268387	A1	12/2004	Wendling	
			2005/0083865	A1	4/2005	Ashley et al.	
			2005/0120049	A1	6/2005	Kanegae et al.	
			2005/0125683	A1	6/2005	Matsuyama et al.	
			2005/0147383	A1	7/2005	Ihara	
			2005/0180568	A1	8/2005	Krause	
			2005/0229213	A1	10/2005	Ellis et al.	
			2005/0271365	A1	12/2005	Hisatomi	
			2005/0273819	A1	12/2005	Knudson et al.	
			2006/0010464	A1	1/2006	Azami	
			2006/0020962	A1	1/2006	Stark et al.	
			2006/0056800	A1	3/2006	Shimagami et al.	
			2006/0075434	A1	4/2006	Chaney et al.	
			2006/0080716	A1	4/2006	Nishikawa et al.	
			2006/0085828	A1	4/2006	Dureau et al.	
			2006/0206819	A1	9/2006	Tsuji et al.	
			2006/0212900	A1	9/2006	Ismail et al.	
			2006/0215993	A1	9/2006	Yamada	
			2006/0274208	A1	12/2006	Pedlow	
			2007/0016546	A1	1/2007	De Vorchik et al.	
			2007/0039032	A1	2/2007	Goldey et al.	
			2007/0061378	A1	3/2007	Lee et al.	
			2007/0154163	A1	7/2007	Cordray	
			2007/0157248	A1	7/2007	Ellis	
			2007/0157253	A1	7/2007	Ellis et al.	
			2007/0165855	A1	7/2007	Inui	
			2007/0183745	A1	8/2007	White	
			2007/0192586	A1	8/2007	McNeely	
			2007/0204288	A1	8/2007	Candelore	
			2007/0234395	A1	10/2007	Dureau et al.	
			2007/0250856	A1	10/2007	Leavens et al.	
			2007/0258596	A1	11/2007	Kahn et al.	
			2008/0046929	A1	2/2008	Cho et al.	
			2008/0052743	A1	2/2008	Moore	
			2008/0092164	A1	4/2008	Agarwal et al.	
			2008/0101760	A1	5/2008	Waller	
			2008/0104534	A1	5/2008	Park et al.	
			2008/0137850	A1	6/2008	Mamidwar	
			2008/0141322	A1	6/2008	Jang et al.	
			2008/0152039	A1	6/2008	Shah et al.	
			2008/0184327	A1	7/2008	Ellis et al.	
			2008/0216119	A1	9/2008	Pfeffer et al.	
			2008/0216136	A1	9/2008	Pfeffer et al.	
			2008/0222678	A1	9/2008	Burke et al.	
			2008/0222681	A1	9/2008	Kwon	
			2008/0271077	A1	10/2008	Kim et al.	
			2008/0273698	A1	11/2008	Manders et al.	
			2008/0276284	A1	11/2008	Bumgardner et al.	
			2008/0288461	A1	11/2008	Glennon et al.	
			2008/0291206	A1	11/2008	Uchimura et al.	
			2008/0298585	A1	12/2008	Maillard et al.	
			2008/0301740	A1	12/2008	Tsutsui	
			2008/0307217	A1	12/2008	Yukimatsu et al.	
			2009/0051579	A1	2/2009	Inaba et al.	
			2009/0067621	A9	3/2009	Wajs	

(56)

**References Cited****U.S. PATENT DOCUMENTS**

2009/0080930 A1 3/2009 Shinotsuka et al.  
 2009/0100466 A1 4/2009 Migos  
 2009/0110367 A1 4/2009 Fukui  
 2009/0129741 A1 5/2009 Kim  
 2009/0129749 A1 5/2009 Oyamatsu et al.  
 2009/0165057 A1 6/2009 Miller et al.  
 2009/0172722 A1 7/2009 Kahn et al.  
 2009/0178098 A1 7/2009 Westbrook et al.  
 2009/0210912 A1 8/2009 Cholas et al.  
 2009/0235298 A1 9/2009 Carlberg et al.  
 2009/0254962 A1 10/2009 Hendricks et al.  
 2009/0260038 A1 10/2009 Acton et al.  
 2009/0320073 A1 12/2009 Reisman  
 2010/0020794 A1 1/2010 Cholas et al.  
 2010/0037282 A1 2/2010 Iwata et al.  
 2010/0050225 A1 2/2010 Bennett  
 2010/0086277 A1 4/2010 Craner  
 2010/0100899 A1 4/2010 Bradbury et al.  
 2010/0115121 A1 5/2010 Roos et al.  
 2010/0135639 A1 6/2010 Ellis et al.  
 2010/0146581 A1 6/2010 Erk  
 2010/0158479 A1 6/2010 Craner  
 2010/0158480 A1 6/2010 Jung et al.  
 2010/0169926 A1 7/2010 Westberg et al.  
 2010/0195827 A1 8/2010 Lee et al.  
 2010/0232604 A1 9/2010 Eklund, II  
 2010/0235862 A1 9/2010 Adachi  
 2010/0239228 A1 9/2010 Sano  
 2010/0247067 A1 9/2010 Gratton  
 2010/0265391 A1 10/2010 Muramatsu et al.  
 2010/0284537 A1 11/2010 Inbar  
 2010/0299528 A1 11/2010 Le Floch  
 2010/0313222 A1 12/2010 Lee et al.  
 2011/0001879 A1 1/2011 Goldey et al.  
 2011/0007218 A1 1/2011 Moran et al.  
 2011/0043652 A1 2/2011 King et al.  
 2011/0078750 A1 3/2011 Tam et al.  
 2011/0099364 A1 4/2011 Robyr et al.  
 2011/0131413 A1 6/2011 Moon et al.  
 2011/0138169 A1 6/2011 Michel  
 2011/0145854 A1 6/2011 Bacon et al.  
 2011/0162011 A1 6/2011 Hassell et al.  
 2011/0179453 A1 7/2011 Poniatowski  
 2011/0225616 A1 9/2011 Ellis  
 2011/0239249 A1 9/2011 Murison et al.  
 2011/0255002 A1 10/2011 Witheiler  
 2011/0286719 A1 11/2011 Woods  
 2011/0311045 A1 12/2011 Candelore et al.  
 2012/0278837 A1 11/2012 Curtis et al.  
 2012/0296745 A1 11/2012 Harper et al.  
 2012/0301104 A1 11/2012 Dove  
 2012/0311534 A1 12/2012 Fox et al.  
 2012/0311634 A1 12/2012 Van Duyn et al.  
 2012/0331505 A1 12/2012 Chun et al.  
 2013/0014146 A1 1/2013 Bhatia et al.  
 2013/0014159 A1 1/2013 Wiser et al.  
 2013/0051555 A1 2/2013 Martch et al.  
 2013/0051758 A1 2/2013 Kummer et al.  
 2013/0051764 A1 2/2013 Casagrande  
 2013/0051766 A1 2/2013 Martch et al.  
 2013/0051773 A1 2/2013 Casagrande  
 2013/0054579 A1 2/2013 Kennedy  
 2013/0055304 A1 2/2013 Kirby et al.  
 2013/0055305 A1 2/2013 Martch et al.  
 2013/0055310 A1 2/2013 Van Duyn et al.  
 2013/0055311 A1 2/2013 Kirby et al.  
 2013/0055314 A1 2/2013 Martch  
 2013/0055333 A1 2/2013 Kummer  
 2013/0216208 A1 8/2013 Kummer et al.  
 2013/0223814 A1 8/2013 Casagrande  
 2013/0243397 A1 9/2013 Minnick et al.  
 2013/0243398 A1 9/2013 Templeman et al.  
 2013/0243399 A1 9/2013 Casagrande et al.  
 2013/0243402 A1 9/2013 Kummer et al.  
 2013/0243403 A1 9/2013 Martch

2013/0243405 A1 9/2013 Templeman et al.  
 2013/0243406 A1 9/2013 Kirby  
 2013/0247089 A1 9/2013 Kummer et al.  
 2013/0247090 A1 9/2013 Kummer et al.  
 2013/0247106 A1 9/2013 Martch et al.  
 2013/0247107 A1 9/2013 Templeman  
 2013/0247111 A1 9/2013 Templeman et al.  
 2013/0247115 A1 9/2013 Minnick  
 2013/0298166 A1 11/2013 Herrington et al.  
 2013/0347037 A1 12/2013 Soroushian  
 2014/0047477 A1 2/2014 VanDuyn  
 2014/0050462 A1 2/2014 Kummer et al.  
 2014/0126889 A1 5/2014 Kummer et al.  
 2014/0130094 A1 5/2014 Kirby et al.  
 2014/0341377 A1 11/2014 Kummer et al.  
 2014/0344858 A1 11/2014 Minnick  
 2014/0363139 A1 12/2014 Kirby  
 2015/0095948 A1 4/2015 Kummer et al.  
 2015/0121430 A1 4/2015 Templeman  
 2015/0208119 A1 7/2015 Casagrande et al.  
 2015/0228305 A1 8/2015 Templeman et al.  
 2015/0245113 A1 8/2015 Casagrande

**FOREIGN PATENT DOCUMENTS**

EP 0 903 743 A 3/1999  
 EP 0 973 333 A 1/2000  
 EP 1 372 339 A2 12/2003  
 EP 1 667 452 B1 6/2006  
 EP 1 742 467 A2 1/2007  
 EP 2 018 059 A1 1/2009  
 EP 2 317 767 A1 5/2011  
 EP 2 357 563 A1 8/2011  
 EP 2 403 239 A1 1/2012  
 EP 2 826 197 A1 1/2015  
 EP 2 826 238 A1 1/2015  
 ER 1 168 347 A 1/2002  
 IN 9740/CHENP/2013 A 9/2014  
 JP 2007 116525 A 5/2007  
 WO 98/12872 A1 3/1998  
 WO 02/41625 A1 5/2002  
 WO 2004/057610 A1 7/2004  
 WO 2007/047410 A2 4/2007  
 WO 2008/010689 A1 1/2008  
 WO 2008/060486 A2 5/2008  
 WO 2011/027236 A1 3/2011  
 WO 2011/081729 A1 7/2011  
 WO 2013/028824 A3 2/2013  
 WO 2013/028829 A2 2/2013  
 WO 2013/028835 A1 2/2013  
 WO 2013/138606 A1 9/2013  
 WO 2013/138608 A1 9/2013  
 WO 2013/138610 A1 9/2013  
 WO 2013/138638 A1 9/2013  
 WO 2013/138689 A1 9/2013  
 WO 2013/138740 A1 9/2013

**OTHER PUBLICATIONS**

U.S. Appl. No. 13/797,173, filed Mar. 12, 2013 Notice of Allowance mailed Feb. 26, 2015, 19 pages.  
 U.S. Appl. No. 13/793,636, filed Mar. 11, 2013, Notice of Allowance mailed Jan. 28, 2015, 43 pages.  
 U.S. Appl. No. 13/800,477, filed Mar. 13, 2013 Notice of Allowance mailed Feb. 18, 2015, 18 pages.  
 Extended European Search Report for EP 12825474 mailed Jan. 7, 2015, 6 pages.  
 Extended European Search Report for EP 12825430 mailed Feb. 3, 2015, all pages.  
 The Office Action dated Nov. 7, 2014 for Mexican Patent Application No. MX/a/2013/014907 is not translated into English, 3 pages.  
 The Office Action dated Jan. 23, 2015 for Mexican Patent Application No. MX/a/2013/014671 is not translated into English, 3 pages.  
 International Preliminary Report on Patentability for PCT/US2012/052002 mailed on Apr. 17, 2014, 10 pages.  
 International Preliminary Report on Patentability, PCT/US2012/052011, mailed on Mar. 6, 2014, 6 pages.

(56)

**References Cited****OTHER PUBLICATIONS**

International Preliminary Report on Patentability, PCT/US2012/051984, mailed on Mar. 6, 2014, 8 pages.

International Preliminary Report on Patentability, PCT/US2012/051964, mailed on Apr. 10, 2014, 7 pages.

International Preliminary Report on Patentability, PCT/US2012/051992, mailed on Apr. 3, 2014, 7 pages.

International Preliminary Report on Patentability, PCT/US2012/051987, mailed on Mar. 6, 2014, 7 pages.

U.S. Appl. No. 13/286,157, filed Oct. 31, 2011, Notice of Allowance mailed Feb. 3, 2014, 81 pages.

U.S. Appl. No. 13/288,002, filed Nov. 2, 2011, Final Office Action mailed Mar. 27, 2014, 20 pages.

U.S. Appl. No. 13/614,899, filed Sep. 13, 2012, Final Office Action mailed Mar. 17, 2014, 41 pages.

U.S. Appl. No. 13/215,598, filed Aug. 23, 2011, Non-Final Office Action mailed Feb. 6, 2014, 12 pages.

U.S. Appl. No. 13/797,173, filed Mar. 12, 2013, Non Final Office Action mailed May 15, 2014, 28 pages.

U.S. Appl. No. 13/799,653, filed Mar. 13, 2013, Non-Final Office Action mailed May 8, 2014, 24 pages.

U.S. Appl. No. 13/829,350, filed Mar. 14, 2013, Non-Final Office Action mailed Feb. 28, 2014, 29 pages.

U.S. Appl. No. 13/828,001, filed Mar. 14, 2013, Notice of Allowance mailed Apr. 25, 2014, 43 pages.

U.S. Appl. No. 13/799,719, filed Mar. 13, 2013, Non Final Office Action mailed Oct. 25, 2013, 79 pages.

U.S. Appl. No. 13/799,719, filed Mar. 13, 2013, Notice of Allowance mailed Apr. 23, 2014, 141 pages.

U.S. Appl. No. 14/064,423, filed Oct. 28, 2013, Non-Final Office Action mailed Dec. 20, 2013, 18 pages.

U.S. Appl. No. 14/064,423, filed Oct. 28, 2013, Notice of Allowance mailed Mar. 4, 2013, 37 pages.

International Search Report of PCT/KR2007/003521 mailed on Oct. 23, 2007, 22 pages.

International Search Report of PCT/IB2003/005737 mailed on Mar. 3, 2004, 21 pages.

Jensen, Craig, "Fragmentation: the condition, the cause, the cure" 'Online!', Executive Software International, 1994; ISBN: 0964004909; retrieved from Internet: <URL: [www.executive.com/fragbook/fragbook.htm](http://www.executive.com/fragbook/fragbook.htm)>Chapter: "How a disk works", Section: "The original problem". Retrieved on Jan. 9, 2014, 70 pages.

U.S. Appl. No. 13/795,914 filed Mar. 6, 2013, Non-Final Office Action mailed Oct. 11, 2013, 17 pages.

International Search Report and Written Opinion of PCT/US2013/32176 mailed on Jun. 25, 2013, 15 pages.

International Search Report and Written Opinion of PCT/US2013/031565 mailed on May 31, 2013, 82 pages.

International Search Report and Written Opinion of PCT/US2013/031915 mailed on Jun. 3, 2013, 7 pages.

International Search Report and Written Opinion of PCT/US2012/51992 mailed Nov. 2, 2012, 15 pages.

International Search Report and Written Opinion of PCT/US2012/51987 mailed Oct. 23, 2012, 20 pages.

International Search Report and Written Opinion of PCT/US2012/051984 mailed Nov. 5, 2012, 13 pages.

International Search Report and Written Opinion of PCT/US2012/52002 mailed Oct. 16, 2012, 17 pages.

International Search Report and Written Opinion of PCT/US2012/51964 mailed Nov. 2, 2012, 13 pages.

International Search Report and Written Opinion of PCT/US2012/052011 mailed Dec. 17, 2012, 44 pages.

Author Unknown, "Move Networks is Delivering the Next Generation of Television," Move Networks, 2010, obtained online at <http://movenetworks.com/>, 2 pages.

Jung, J., et al., "Design and Implementation of a Multi-Stream CableCARD with a High-Speed DVB-Common Descrambler," ACM Multimedia, 2006, 4 pages.

U.S. Appl. No. 13/149,852, filed May 31, 2011, Non-Final Office Action mailed Dec. 12, 2012, 9 pages.

U.S. Appl. No. 13/286,157, filed Oct. 31, 2011, Non-Final Office Action mailed Jan. 17, 2013, 20 pages.

U.S. Appl. No. 13/215,702, filed Aug. 23, 2011, Notice of Allowance mailed Feb. 11, 2013, 13 pages.

U.S. Appl. No. 13/302,852, filed Nov. 22, 2011, Non-Final Rejection mailed May 23, 2013, 19 pages.

U.S. Appl. No. 13/324,831, filed Dec. 13, 2011 Non-Final Office Action mailed Feb. 28, 2013, 23 pages.

U.S. Appl. No. 13/292,047, filed Nov. 8, 2011 Non-Final Office Action mailed Jan. 18, 2013, 17 pages.

U.S. Appl. No. 13/614,899, filed Sep. 13, 2012 Non-Final Office Action mailed Feb. 5, 2013, 17 pages.

U.S. Appl. No. 13/291,014, filed Nov. 7, 2011 Non-Final Office Action mailed Mar. 29, 2013, 21 pages.

U.S. Appl. No. 13/215,916, filed Aug. 23, 2011 Notice of Allowance mailed Jan. 4, 2013, 10 pages.

U.S. Appl. No. 13/757,168, filed Feb. 1, 2013 Non Final Office Action mailed Jun. 4, 2014, 23 pages.

U.S. Appl. No. 13/799,604, filed Mar. 13, 2013 Non Final Office Action mailed Jun. 6, 2014, 24 pages.

U.S. Appl. No. 13/614,899, filed Sep. 13, 2012 Non-Final Office Action mailed May 20, 2014, 25 pages.

U.S. Appl. No. 13/215,598, filed Aug. 23, 2011 Final Office Action mailed Jul. 2, 2014, 22 pages.

U.S. Appl. No. 13/294,005, filed Nov. 11, 2011 Non-Final Office Action mailed May 20, 2014, 33 pages.

U.S. Appl. No. 13/829,350, filed Mar. 14, 2013 Non Final Office Action mailed Jul. 29, 2014, 24 pages.

U.S. Appl. No. 13/795,914, filed Mar. 6, 2013 Notice of Allowance mailed Jul. 21, 2014, 13 pages.

U.S. Appl. No. 13/795,914, filed Mar. 6, 2013, Final Office Action mailed Apr. 3, 2014, 17 pages.

International Search Report and Written Opinion of PCT/US2013/031432 mailed May 28, 2013, 10 pages.

International Preliminary Report on Patentability for PCT/US2013/031432 issued Sep. 16, 2014, 9 pages.

International Search Report and Written Opinion of PCT/US2013/031445 mailed May 24, 2013, 11 pages.

International Preliminary Report on Patentability for PCT/US2013/031445 issued Sep. 16, 2014, 10 pages.

International Preliminary Report on Patentability for PCT/US2013/032176 mailed Sep. 25, 2014, 7 pages.

International Preliminary Report on Patentability for PCT/US2013/031565 issued Sep. 16, 2014, 18 pages.

International Preliminary Report on Patentability for PCT/US2013/031915 issued Sep. 16, 2014, 5 pages.

U.S. Appl. No. 13/302,852, filed Nov. 22, 2011 Non-Final Rejection mailed Sep. 2, 2014, 28 pages.

U.S. Appl. No. 13/793,363, filed Mar. 11, 2013, Non-Final Office Action mailed Sep. 29, 2014, 27 pages.

U.S. Appl. No. 13/800,477, filed Mar. 13, 2013 Non-Final Office Action mailed Sep. 11, 2014, 34 pages.

Author Unknown, "EE Launches home TV service in UK," dated Oct. 8, 2014, 3 pages Retrieved on Oct. 13, 2014 from <http://www.bbc.com/news/technology-29535279>.

Author Unknown, "EE TV Its simply great television," Accessed on Oct. 13, 2014, 11 pages Retrieved from <https://ee.co.uk/ee-and-me/ee-tv>.

McCann, John, "EE TV set top takes aim at Sky, Virgin Media and YouView," dated Oct. 8, 2014, 5 pages Retrieved on Oct. 13, 2014 from <http://www.techradar.com/news/television/ee-tv-set-top-box-takes-aim-at-sky-virgin-media-and-youview-1268223>.

Williams, Christopher, "EE to launch TV set-top box," dated Oct. 7, 2014, 2 pages. Retrieved on Oct. 13, 2014 from <http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/telecoms/11147319/EE-to-launch-TV-set-top-box.html>.

U.S. Appl. No. 13/288,002, filed Nov. 2, 2011, Non-final Office Action mailed Sep. 26, 2013, 15 pages.

U.S. Appl. No. 13/324,831, filed Dec. 13, 2011 Notice of Allowance mailed Sep. 4, 2013, 22 pages.

U.S. Appl. No. 13/292,047, filed Nov. 8, 2011 Final Office Action mailed Aug. 19, 2013, 17 pages.

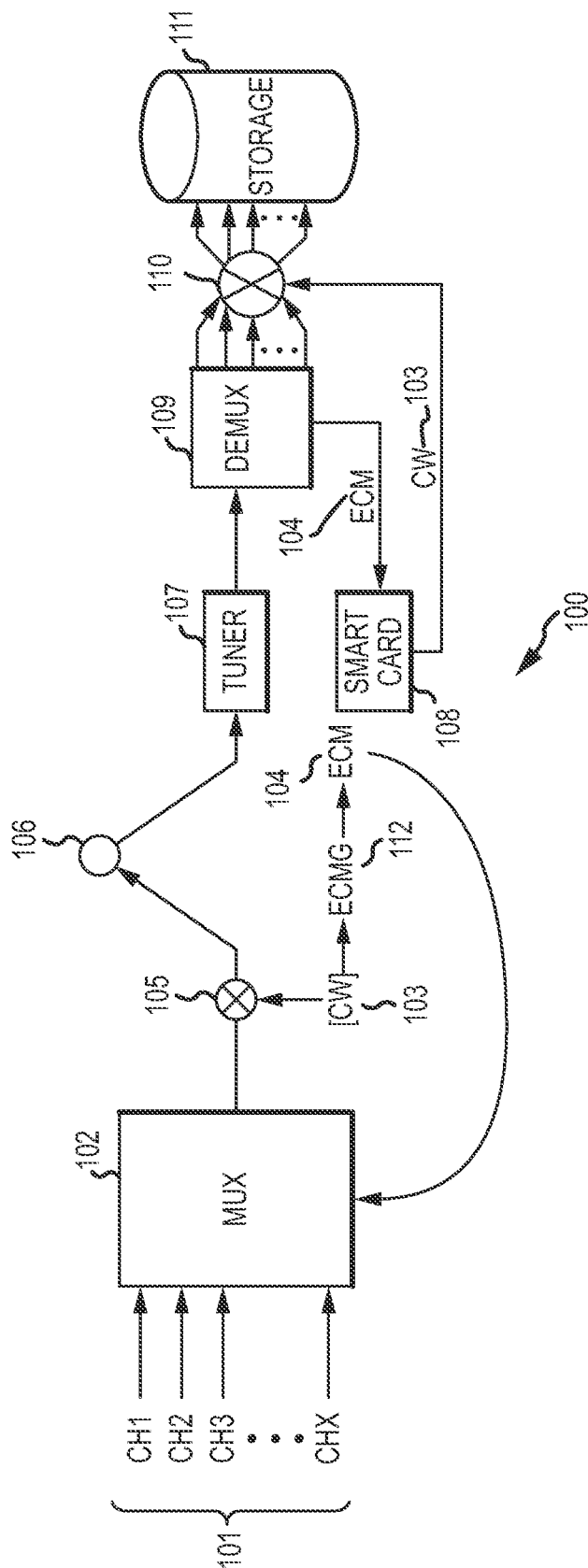
(56)

**References Cited****OTHER PUBLICATIONS**

U.S. Appl. No. 13/614,899, filed Sep. 13, 2012 Non-Final Office Action mailed Sep. 17, 2013, 17 pages.  
 U.S. Appl. No. 13/291,014, filed Nov. 7, 2011 Notice of Allowance mailed Aug. 7, 2013, 16 pages.  
 U.S. Appl. No. 13/215,598, filed Aug. 23, 2011 Non-Final Office Action mailed Jun. 20, 2013, 15 pages.  
 U.S. Appl. No. 13/215,655, filed Aug. 23, 2011 Non-Final Office Action mailed Sep. 6, 2013, 27 pages.  
 U.S. Appl. No. 13/294,005, filed Nov. 11, 2011 Non-Final Office Action mailed Aug. 14, 2013, 32 pages.  
 U.S. Appl. No. 13/829,976, filed Aug. 23, 2012 Notice of Allowance mailed Oct. 7, 2013, 18 pages.  
 U.S. Appl. No. 14/095,860, filed Dec. 3, 2013 Non-Final Office Action mailed Dec. 26, 2014, 45 pages.  
 U.S. Appl. No. 14/043,617, filed Oct. 1, 2013 Non-Final Office Action mailed Jan. 5, 2015, 45 pages.  
 U.S. Appl. No. 13/856,752, filed Apr. 4, 2013 Non-Final Office Action mailed Nov. 5, 2014, 34 pages.  
 U.S. Appl. No. 13/829,350, filed Mar. 14, 2013 Final Office Action mailed Jan. 23, 2015, 18 pages.  
 U.S. Appl. No. 13/799,653, filed Mar. 13, 2013 Notice of Allowance mailed Nov. 26, 2014, 32 pages.  
 U.S. Appl. No. 13/799,604, filed Mar. 13, 2013, Final Office Action mailed Jan. 14, 2015, 36 pages.  
 U.S. Appl. No. 13/797,173, filed Mar. 12, 2013 Notice of Allowance, mailed Nov. 24, 2014, 37 pages.  
 U.S. Appl. No. 13/757,168, filed Feb. 1, 2013 Notice of Allowance mailed Oct. 14, 2014, 28 pages.  
 U.S. Appl. No. 13/294,005, filed Nov. 11, 2011 Notice of Allowance mailed Oct. 31, 2014, 24 pages.  
 U.S. Appl. No. 13/292,005, filed Nov. 11, 2011 Notice of Allowance mailed Oct. 31, 2014, 24 pages.  
 U.S. Appl. No. 13/215,598, filed Aug. 23, 2011 Non-Final Office Action mailed Nov. 25, 2014, 18 pages.  
 Extended European Search Report for EP 12825080 mailed Sep. 11, 2014, 10 pages.  
 Extended European Search Report for EP 12825521 mailed Nov. 24, 2014, 7 pages.  
 International Search Report and Written Opinion of PCT/US2013/031440 mailed May 30, 2013, 14 pages.  
 International Preliminary Report on Patentability for PCT/US2013/031440 mailed Sep. 25, 2014, 8 pages.  
 The Office Action dated Nov. 6, 2014 for Mexican Patent Application No. MX/a/2013/014677 is not translated into English, 2 pages.  
 U.S. Appl. No. 13/294,005, filed Nov. 11, 2011 Final Office Action mailed Jan. 3, 2014, 29 pages.  
 U.S. Appl. No. 13/215,655, filed Aug. 23, 2011 Final Office Action mailed Dec. 18, 2013, 20 pages.  
 U.S. Appl. No. 13/302,852, filed Nov. 22, 2011, Final Rejection mailed Dec. 9, 2013, 23 pages.  
 U.S. Appl. No. 13/215,598, filed Aug. 23, 2011 Final Office Action mailed Nov. 21, 2013, 23 pages.  
 U.S. Appl. No. 13/286,157, filed Oct. 31, 2011 Non-Final Office Action mailed Jul. 25, 2013, 49 pages.  
 U.S. Appl. No. 13/149,852, filed May 31, 2011, Notice of Allowance, mailed Jul. 11, 2013, 13 pages.  
 U.S. Appl. No. 13/149,852 filed May 31, 2011, Final Office Action mailed Mar. 26, 2013, 13 pages.  
 U.S. Appl. No. 14/095,860, filed Dec. 3, 2013 Final Office Action mailed May 1, 2015, 18 pages.

U.S. Appl. No. 14/060,388, filed Oct. 22, 2013 Notice of Allowance mailed Apr. 13, 2015, 44 pages.  
 U.S. Appl. No. 13/801,968, filed Mar. 13, 2013 Non Final Office Action mailed May 21, 2015, 49 pages.  
 U.S. Appl. No. 13/614,899, filed Sep. 13 2012 Notice of Allowance mailed Mar. 13, 2015, 35 pages.  
 U.S. Appl. No. 13/302,852, filed Nov. 22, 2011 Final Rejection mailed Mar. 30, 2015, 29 pages.  
 U.S. Appl. No. 13/215,598, filed Aug. 23, 2011 Final Office Action mailed May 5, 2015, 17 pages.  
 The Notice of Allowance by the Mexican Institute of Industrial Property for Mexican Patent Application No. MX/a/2013/014907 dated Feb. 20, 2015 is not translated into English, 1 page.  
 The Notice of Allowance by the Mexican Institute of Industrial Property for Mexican Patent Application No. MX/a/2013/014677 dated Mar. 19, 2015 is not translated into English, 1 page.  
 European Search Report for EP 12825653 dated Mar. 11, 2015, 7 pages.  
 Supplementary European Search Report for Application No. EP 12825147 dated Mar. 27, 2015, 9 pages.  
 The second Office Action dated Feb. 26, 2015 for Mexican Pat. Appln. No. MX/a/2013/014217 is not translated into English, 3 pages.  
 The Notice of Allowance by the Mexican Institute of Industrial Property for Mexican Patent Application No. MX/a/2013/014671 dated Apr. 17, 2015 is not translated into English, 1 page.  
 Office Action dated May 18, 2015 for Mexican Patent Application No. MX/a/2014/009776, 2 pages.  
 Office Action dated May 12, 2015 for Mexican Patent Application No. MX/a/2014/009723, 2 pages.  
 U.S. Appl. No. 14/467,959, filed Aug. 25, 2014 Notice of Allowance mailed Jun. 22, 2015, 36 pages.  
 U.S. Appl. No. 14/095,860, filed Dec. 3, 2013 Notice of Allowance mailed Jul. 13, 2015, 31 pages.  
 U.S. Appl. No. 13/799,604, filed Mar. 13, 2013, Notice of Allowance mailed May 29, 2015, 46 pages.  
 U.S. Appl. No. 13/302,852, filed Nov. 22, 2011, Notice of Allowance mailed Jun. 19, 2015, 26 pages.  
 U.S. Appl. No. 13/292,047, filed Nov. 8, 2011 Non-Final Office Action mailed Jul. 7, 2015, 28 pages.  
 U.S. Appl. No. 14/340,190, filed, Jul. 24, 2014 Non-Final Rejection mailed Aug. 31, 2015, 74 pages.  
 U.S. Appl. No. 14/154,887, filed Jan. 14, 2014 Non-Final Rejection mailed Jul. 17, 2015, 33 pages.  
 U.S. Appl. No. 13/799,604, filed Mar. 13, 2013 Notice of Allowance mailed Jul. 24, 2015, 34 pages.  
 U.S. Appl. 13/288,002, filed Nov. 2, 2011 Non Final Rejection mailed Jul. 28, 2015, 29 pages.  
 U.S. Appl. No. 13/829,350, filed Mar. 14, 2013 Notice of Allowance mailed Jul. 24, 2015, 29 pages.  
 U.S. Appl. No. 14/043,617, filed Oct. 1, 2013 Final Office Action mailed Jul. 16, 2015, 45 pages.  
 Supplementary European Search Report for EP 13761291.7 mailed Jul. 9, 2015, 8 pages.  
 Extended European Search Report for EP 13760237.1 received Jul. 21, 2015, 8 pages.  
 First Office Action and Search Report from the State Intellectual Property Office (SIPO) for CN 201280031434.7, issued Jul. 17, 2015, 12 pages.  
 Office Action dated Jul. 31, 2015 for Mexican Patent Application No. MX/a/2014/009928, 2 pages.

\* cited by examiner



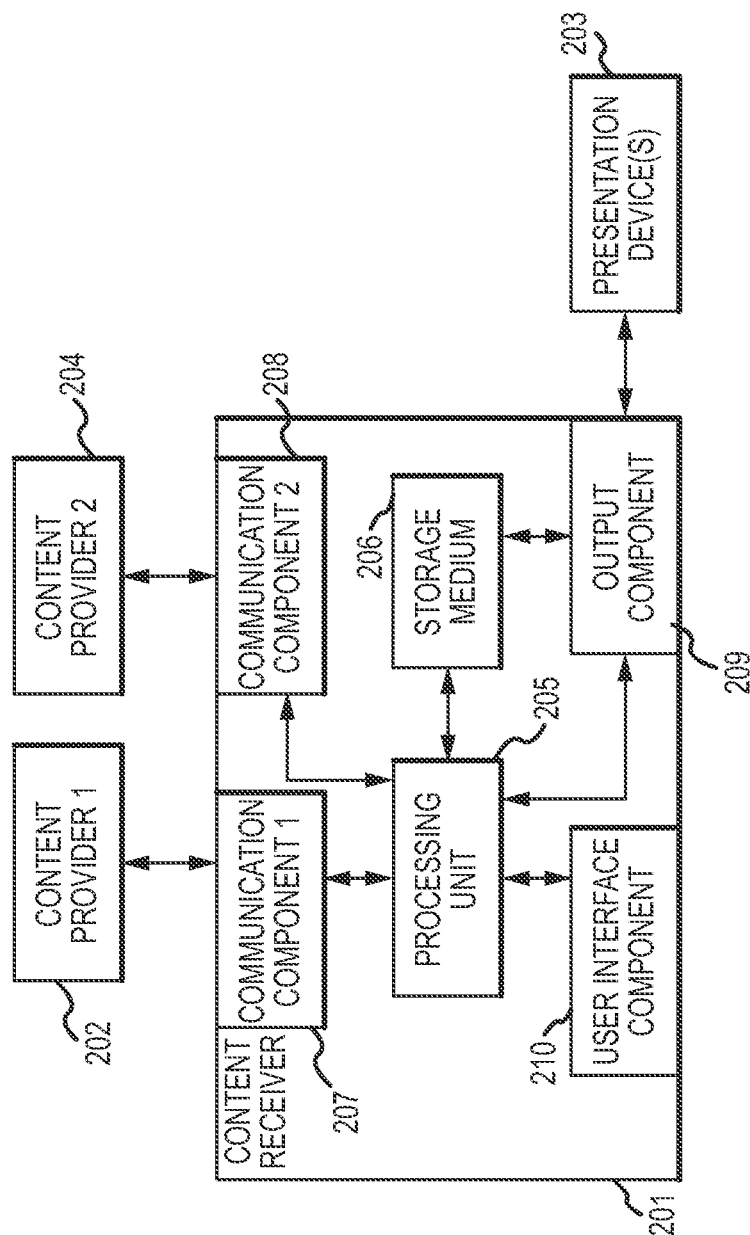


FIG. 2

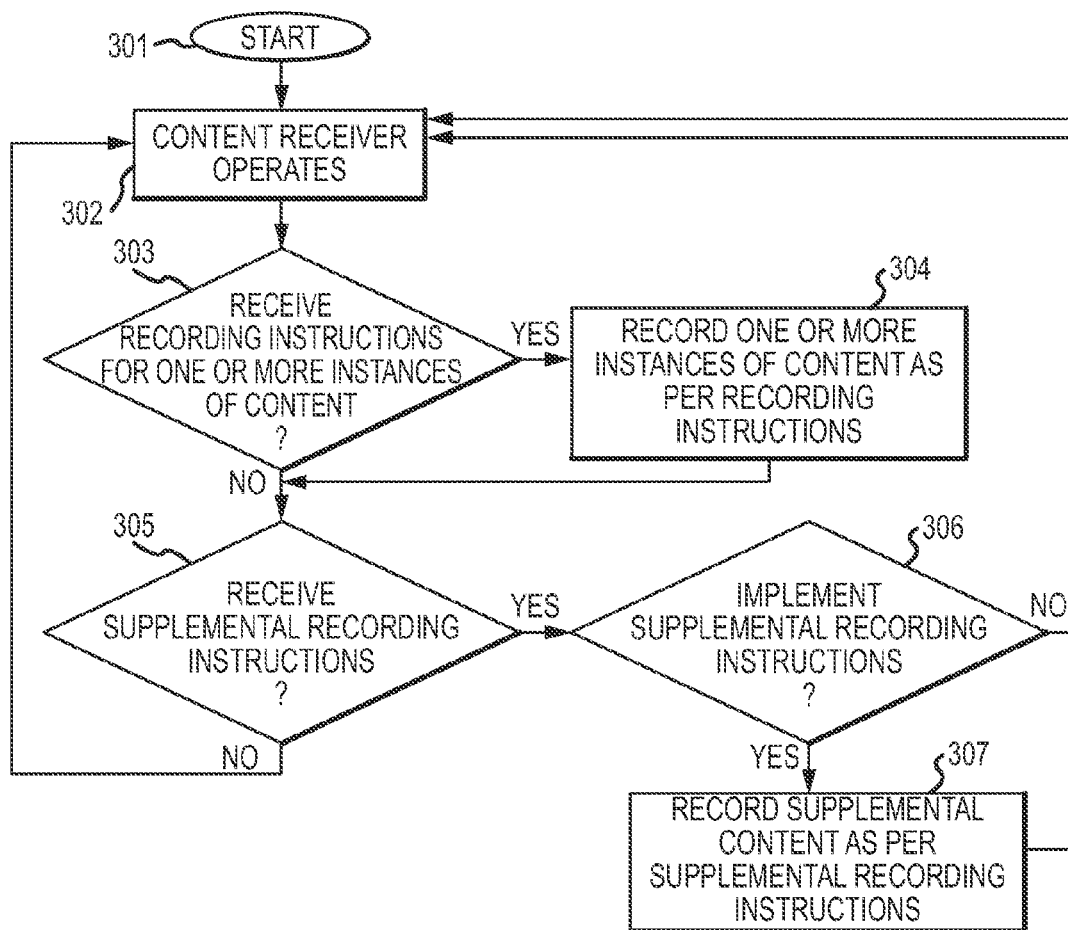


FIG.3

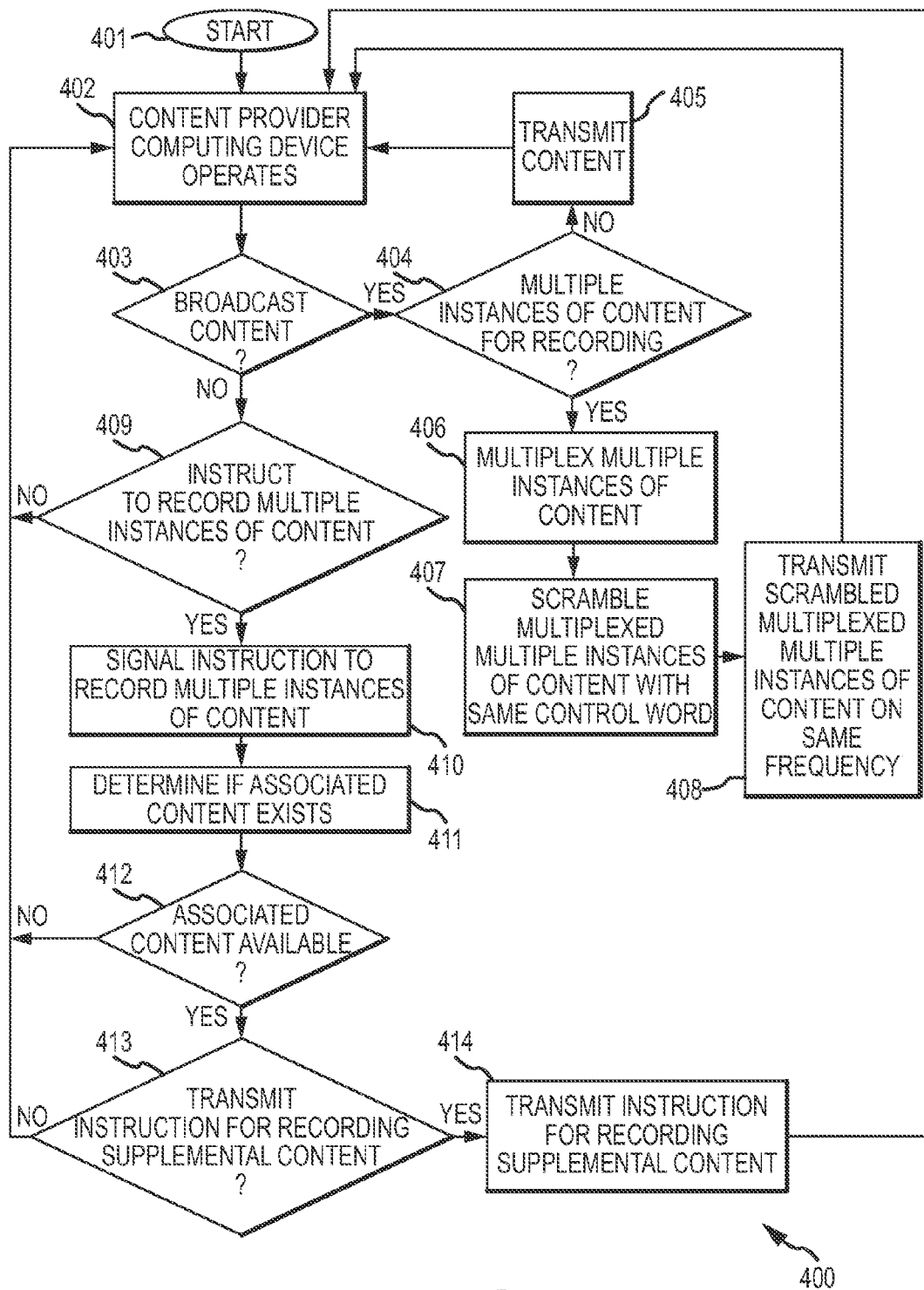


FIG.4

1

## AUTOMATICALLY RECORDING SUPPLEMENTAL CONTENT

### CROSS-REFERENCES TO RELATED APPLICATIONS

This Application is a Continuation and claims priority to co-pending U.S. patent application Ser. No. 13/215,702, filed on Aug. 23, 2011, and entitled AUTOMATICALLY RECORDING SUPPLEMENTAL CONTENT, the entire disclosure of which is incorporated by reference for all purposes.

### FIELD OF THE INVENTION

This disclosure relates generally to content recording, and more specifically to automatically recording content that is associated with other automatically recorded content and therefore supplements the other automatically recorded content (which may replace instead of adding to the other content in some cases).

### SUMMARY

Content may be defined as online content if it is broadcast by a programming provider and may be defined as offline content if it is available from a source other than broadcast by the programming provider. In one or more implementations, systems and methods of the present disclosure may supplement recording of online content that is automatically recorded when broadcast by a programming provider (such as a satellite programming provider) by automatically recording one or more instances of offline content (which are associated in one or more ways with the online recorded content) from a source other than the content broadcast by the programming provider. For example, the offline content may include content broadcast by one or more terrestrial broadcast systems and/or other over-the-air content transmission systems, content available via one or more Internet protocol connections, and/or any source of content other than that broadcast by the programming provider. Further, the recorded offline content may be considered to supplement the recorded online content because the recorded offline content is associated with the recorded online content and is obtained from a source other than the broadcast of the programming provider as opposed to the recorded offline content being limited to trailers for the recorded online content and/or other such supporting content.

As such, the present disclosure discloses systems and methods for automatically recording supplemental content. One or more first content providers may transmit instructions to one or more content receivers to record multiple instances of content. The multiple instances of content may be included in the same frequency band of at least one broadcast transmitted by the content provider via a first communication link and scrambled utilizing the same control word. The content provider may determine to supplement the multiple instances of content (which may be based on associations between the multiple instances of content and supplemental content) and may transmit one or more instructions to record one or more supplemental instances of content from at least one second content provider via a second communication link.

The content receiver may receive the instructions to record the multiple instances of content and may accordingly receive and store (and/or descramble, decode, display, and/or perform other such operations) the multiple instances of content. The content receiver may also receive the instruction to record the supplemental instance of content and receive the

2

supplemental instance of content via the second communication link and store the supplemental instance of content.

In some implementations, the first communication link may be a satellite communication link and the second communication link may be a different type of communication link such as a terrestrial broadcast communication link and/or an Internet protocol communication link.

In various implementations, the multiple instances of content may all be members of a group of content and the supplemental instances of content may be members of the group of content that are not included in the multiple instances of content, different versions of instances of content included in the multiple instances of content, instances of content that correspond to subchannels of channels that correspond to instances of content included in the multiple instances of content, and so on.

In some implementations, the supplemental instance of content may be not be available from the content provider that provides the multiple instances of content but is available from another content provider. Further, in various implementations, the supplemental instances of content may be selected based on received user input. Moreover, in some implementations, the recording of the supplemental instance of content may replace one or more of the recorded multiple instances of content.

It is to be understood that both the foregoing general description and the following detailed description are for purposes of example and explanation and do not necessarily limit the present disclosure. The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate subject matter of the disclosure. Together, the descriptions and the drawings serve to explain the principles of the disclosure.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram illustrating a system for automatically recording multiple instances of content from one or more programming providers.

FIG. 2 is a block diagram illustrating a system for automatically recording supplemental content. This system may be interrelated with the system of FIG. 1.

FIG. 3 is a flow chart illustrating a first example method for automatically recording supplemental content. This method may be performed by the system of FIG. 2.

FIG. 4 is a flow chart illustrating a second example method for automatically recording supplemental content. This method may be performed by the system of FIG. 2.

### DETAILED DESCRIPTION OF THE EMBODIMENTS

The description that follows includes sample systems, methods, and computer program products that embody various elements of the present disclosure. However, it should be understood that the described disclosure may be practiced in a variety of forms in addition to those described herein.

In various implementations, systems and methods of the present disclosure may supplement automatic recording of online content broadcast by a programming provider (such as a satellite programming provider) by automatically recording associated offline content from a source other than the programming provider. For example, the offline content may be obtained from one or more terrestrial broadcast systems and/or other over-the-air content transmission systems, one or more Internet protocol connections, and/or any source of content other than the programming provider. Hence, content

may be considered online if it is broadcast by the programming provider and offline if it is available from a source other than broadcast by the programming provider. Additionally, the recorded offline content may be considered to supplement the recorded online content because the recorded offline content is associated with the recorded online content and is obtained from a source other than the broadcast of the programming provider. The recorded offline content is not limited to trailers for the recorded online content and/or other such supporting content because the recorded offline content is referred to herein as supplementary content.

Content receivers (such as set top boxes, television receivers, digital video recorders, mobile computers, cellular telephones, smart phones, tablet computers, desktop computers, and so on) may receive content from one or more programming providers (such as satellite television programming providers, cable television programming providers, Internet service providers, video on demand providers, pay-per-view movie providers, digital music providers, and so on) via one or more communication connections (such as satellite communication connections, coaxial cable communication connections, Internet communication connections, radio-frequency connections, and so on). Such content receivers may transmit such received content to one or more presentation devices and/or store the received content for later presentation.

Users of content receivers may desire to access different instances of content that are broadcast simultaneously and/or substantially contemporaneously by content providers. For example, many television programming viewers wish to watch different television programs that occupy the same broadcast time slot, such as the different television programs associated with the major television programs that are broadcast between seven PM and ten PM mountain time. Content receivers may attempt to address this issue by utilizing multiple tuners that can each separately present and/or record different, simultaneously broadcast instances of content. However, a separate tuner may still be required for each simultaneous or substantially contemporaneous instance of broadcast or otherwise received content that a content receiver user wishes to view and/or record. Further, in addition to separate tuners required for each instance of content, the content receiver may require sufficient resources to descramble and store each of the instances of content desired by the user.

FIG. 1 is a block diagram illustrating a system **100** for automatically recording multiple instances of content from one or more programming providers. The automatic recording of multiple instances of content provided by the system **100** may enable users of content receivers to access different instances of content that are broadcast simultaneously and/or substantially contemporaneously by content providers.

In various broadcast systems, content providers may broadcast content to a plurality of different content receivers via one or more frequency bands utilizing one or more satellites. Each multiplexed signal contained in the frequency band (sometimes referred to as a transponder) may be configured to include data related to one or more instances of content, such as one or more television programming channels. The data related to each of the programs may include multiple PIDs (packet identifiers), such as a video PID and one or more audio PIDs for a particular instance of content. The data related to each of the instances of content included in each frequency may be scrambled utilizing one or more CWs (control words), which may then be encrypted to generate one or more ECMs (entitlement control messages) which may in turn be included with the data. A content receiver may typi-

cally tune to one or more of the frequency bands to receive the multiplexed signal that contains data for a particular programming channel utilizing one or more tuners. The content receiver may process only a subset of the programming channels by keeping the data associated with the particular programming channel and discarding data received via the tuned frequency band and multiplexed signal associated with other programming channels, such as by utilizing a PID filter to keep data identified by PIDs related to the particular programming channel and discard data identified by PIDs not related to that particular programming channel. The content receiver may decrypt the ECM included with the data associated with the particular programming channel to obtain the CW, descramble the data utilizing the CW, and store and/or transmit the data (e.g., decompressed, reconstructed audio and video data) to one or more presentation devices.

As illustrated in FIG. 1, in this implementation, one or more content providers may select multiple instances of content **101** to be automatically recorded such as by utilizing predefined recording parameters. For example, a content provider may select all of the television events defined as “prime-time events” associated with all channels defined as “prime-time television channels” for a particular period of time defined as “prime time” to be automatically recorded. In other examples, the content provider may select television events associated with programming channels for a particular time period (such as a half hour, multiple hours, and/or an entire programming day) in response to user selections. After the content provider selects the multiple instances of content, the multiple instances of content may be multiplexed utilizing a multiplexer **102**. The multiplexed signal (which includes the multiplexed selected multiple instances of content) may then be scrambled by a scrambler **105** utilizing one or more CWs **103**. The CW may be encrypted to generate an ECM by an ECM generator **112** which may take the CW as an input (and may also include other information such as access criteria) and outputs the ECM, which may be included with the multiplexed signal. The scrambled multiplexed signal may then be included in a broadcast on a frequency band (e.g., cable, satellite), which may then be transmitted to one or more satellites **106** for broadcast. The satellite **106** may receive the frequency band (uplink frequency band) and then broadcast the multiplexed signal to a number of content receivers on a translated frequency band (downlink frequency band), such as a content receiver that includes a tuner **107**.

The tuner **107** may tune to the frequency band that includes the multiple instances of content (which may be performed in response to one or more recording instructions received by the content receiver that includes the tuner from the content provider). The data received via the tuned frequency (which may be filtered by a PID filter, not shown) may be demultiplexed by a demultiplexer **109** and then descrambled by a descrambler **110** utilizing the CW before being stored in a non-transitory storage medium **111** (which may take the form of, but is not limited to, a magnetic storage medium; optical storage medium; magneto-optical storage medium; read only memory; random access memory; erasable programmable memory; flash memory; and so on) based on recording parameters, such as predefined recording parameters. The demultiplexer **109** may obtain the included ECM **104**, and the ECM may be provided to a smart card **108** that may decrypt the ECM **104** to obtain the CW **103** for the descrambler **110**. Hence, the multiple instances of content may subsequently all be available to a user of the content receiver (until such time as they are removed from the non-transitory storage medium) without requiring multiple tuners to receive each of the multiple instances of content, without requiring the smart card to

5

decrypt multiple ECMs. In some implementations, the multiple instances of content may be stored in a single file.

Although the system **100** is illustrated in FIG. **1** and is described above as including a number of specific components configured in a specific arrangement, it is understood that this is for the purposes of example and other arrangements involving fewer and/or additional components are possible without departing from the scope of the present disclosure. For example, in various implementations, the multiple instances of content may be individually scrambled utilizing the CW prior to multiplexing. In another example, in some implementations, the data received via the tuned frequency may be demultiplexed before being individually descrambled utilizing the CW.

In some implementations of the system of FIG. **1**, multiple instances of content may be recorded simultaneously from a single transponder and stored in the non-transitory storage medium **111** of the content receiver as a single file of multiple recorded instances of content. Upon playing of one instance of content from the single file of the multiple recorded instances of content, the content receiver may read the file incrementally so as to play the one instance of content while filtering out the other file contents (e.g., the other instance of content within the file).

The system **100** provides automatic recording of multiple instances of content from a content provider. However, the system **100** may not provide the ability to also automatically record supplemental content that is associated with the multiple instances of content. This may particularly be the case if the supplemental content is not available from the content provider, such as when a particular television channel (and/or a particular subchannel of a channel that is carried) is not carried by a content provider.

For example, the multiple instances of content may include all of the television programming aired by three of the four major television networks between the times of seven PM and 10 PM mountain time. It may be desired to automatically record all of the television programming aired by all four major television networks between the times of seven PM and 10 PM mountain time, but the content provider may not be able to provide the television programming aired by the fourth major television network. In another example, the multiple instances of content available from the content provider may have a particular resolution, but other versions of the multiple instances of content that have a higher resolution may be available from other sources. As such, a user may want to automatically record higher resolution versions to supplement the automatic recording of the multiple instances of content, possibly replacing one or more of the multiple instances of content that is automatically recorded.

The present disclosure discloses systems and methods for automatically recording supplemental content. At least one first content provider may transmit instructions to one or more content receivers to record multiple instances of content. The instructions may specify for the content receiver to record the multiple instances of content from at least one broadcast transmitted by the content provider via a first communication link (such as a satellite communication link) wherein the multiple instances of content are all included in the same frequency band of the broadcast and scrambled utilizing the same control word.

The content provider may determine to supplement the multiple instances of content and may transmit one or more instructions to record one or more supplemental instances of content from at least one second content provider via a second communication link (such as a terrestrial broadcast communication link and/or an Internet protocol communication

6

link). The content provider may determine to supplement the multiple instances of content based on one or more associations between the multiple instances of content and the supplemental instance of content.

The content receiver may receive the instructions to record the multiple instances of content. In response to the instructions to record the multiple instances of content, the content receiver may accordingly receive the multiple instances of content via the first communication link, descramble the multiple instances of content utilizing the same control word (which may be obtained by decrypting the same entitlement control message), and store the multiple instances of content. The content receiver may also receive the instruction to record the supplemental instance of content, receive the supplemental instance of content via the second communication link, and store the supplemental instance of content. As such, the content receiver is enabled to automatically record the multiple instances of content from the first content provider as well as automatically record supplemental instances of content.

FIG. **2** is a block diagram illustrating a system **200** for automatically recording supplemental content. This system **200** may be interrelated with the system **100** of FIG. **1**. The system **200** includes a content receiver **201** which may be any kind of content receiver such as a set top box, a television receiver, a digital video recorder, a mobile computer, a cellular telephone, a smart phone, a tablet computer, a desktop computer, and/or any other kind of device capable of receiving content from one or more content providers. The system may also include a content provider **202** and a content provider **204**, both of which may be any kind of content provider such as a satellite and/or cable television provider, a video on demand provider, a pay-per-view movie provider, a digital music provider, and/or any other provider capable of transmitting content to the content receiver. Further, the system may include one or more presentation devices **203** which may be any kind such as a cathode ray tube display, a liquid crystal display, a computer monitor, a television, a speaker, a plasma screen display, a printer, and/or any other device capable of presenting content transmitted by the content receiver.

The content receiver **201** may include one or more processing units **205**, non-transitory storage media **206**, communication components 1 and 2 **207** and **208**, output component **209**, and user interface components **210**. The processing unit may execute instructions stored in the non-transitory storage medium to receive content from the content provider 1 **202** via the communication component 1 **207** and/or receive content from the content provider 2 **204** via the communication component 2 **208**, store such content in the non-transitory storage medium, and/or transmit such content to the presentation device **203** via the output component. The processing unit may perform such actions in response to instructions received from a user via the user interface component and/or instructions received from the content provider 1 **202** via the communication component 1 **207** and/or receive content from the content provider 2 **204** via the communication component 2 **208**.

The content receiver **201** may receive instructions for automatically recording multiple instances of content from the content provider 1 **202** via the communication component **207** as described with respect to FIG. **1** above (in which case the communication component 1 **207** may perform the functions of the tuner **107** and the processing unit **105** may include components that perform the functions of the smart card **108**, the descrambler **110**, and/or the demultiplexer **109**). The multiple instances of content be included in one or more broadcasts transmitted the content provider 1 **202** via a first com-

7

munication link (such as a satellite communication link) to the communication component 207 wherein the multiple instances of content are all included in the same frequency band of the broadcast and scrambled utilizing the same control word. Based on the instructions for automatically recording the multiple instances of content, the content receiver may receive the multiple instances of content, descramble the multiple instances of content utilizing the same control word, and store the multiple instances of content in the non-transitory storage medium.

The content receiver 201 may receive instructions for automatically recording one or more supplemental instances of content. The instructions for automatically recording the supplemental instance of content may be received from the content provider 1 202 via the communication component 207 and may specify to record the supplemental instance of content from the content provider 2 204 via a second communication link (such as a terrestrial broadcast link and/or an Internet protocol link) utilizing the communication component 2 208. The supplemental content may have one or more associations with the multiple instances of content.

As described with respect to FIG. 1 above, in some implementations, the multiple instances of content may all be members of a group of content, such as television programming aired by one or more of the major four television networks between the hours of seven PM and ten PM mountain time. In such implementations, the supplemental instances of content may include instances of content that are members of the group of content but are not included in the multiple instances of content, different versions of instances of content included in the multiple instances of content (such as higher resolution versions), instances of content that correspond to subchannels of channels that correspond to instances of content included in the multiple instances of content, and so on.

In some implementations, the supplemental instance of content may be available from the content provider 2 204 but may not be available from the content provider 1 202. Further, in various implementations, the content provider 1 202 may select the supplemental instance of content to transmit recording instructions regarding in response to user input received via the user interface component 210. Moreover, in some implementations, the supplemental instance of content may replace one of more of the multiple instances of content and the respective instance of content of the multiple instance of content may be deleted, overwritten, and/or otherwise removed from the non-transitory storage medium 206 when the supplemental instance of content is recorded.

FIG. 3 illustrates a first example method 300 for automatically recording supplemental content. The method 300 may be performed by the content receiver 201 of FIG. 2. The flow begins at block 301 and proceeds to block 302 where the content receiver operates. The flow then proceeds to block 303 where the processing unit 205 determines whether or not instructions to automatically record one or more instances of content have been received. If so, the flow proceeds to block 304 where the processing unit records the one or more instances of content in the non-transitory storage medium 206 before the flow proceeds to block 305. Otherwise, the flow proceeds directly to block 305.

At block 305, the processing unit 205 determines whether or not supplemental instructions to automatically record supplemental instances of content have been received. If not, returns to block 302 and the content receiver 201 continues to operate. Otherwise, the flow proceeds to block 306.

At block 306, after the processing unit 205 determines that supplemental instructions to automatically record supplemental instances of content have been received, the process-

8

ing unit determines whether or not to implement the supplemental instructions to automatically record the supplemental instances of content. The processing unit may make this determination based on one or more user inputs, configuration settings, and so on. If so, the flow proceeds to block 307 where the processing unit records the supplemental instances of content in the non-transitory storage medium before the flow returns to block 302 and the content receiver 201 continues to operate. Otherwise, the flow returns directly to block 302 and the content receiver continues to operate.

FIG. 4 illustrates a second example method 400 for automatically recording supplemental content. The method 400 may be performed by one or more computing devices of the content provider 1 202 of FIG. 2. The flow begins at block 401 and proceeds to block 402 where the computing device of the content provider 1 202 operates. The flow then proceeds to block 403 where the computing device of the content provider determines whether or not to broadcast content to the content receiver 201. The computing device of the content provider may broadcast content to the content receiver as part of broadcasting content to a plurality of different content receivers. If so, the flow proceeds to block 404. Otherwise, the flow proceeds to block 409.

At block 404, after the computing device of the content provider 1 202 determines to transmit content to the content receiver 201, the computing device of the content provider determines whether or not the content to be transmitted includes multiple instances of content to be automatically recorded. If not, the flow proceeds to block 405 where the computing device of the content provider transmits content to the content receiver before the flow returns to block 402 and the computing device of the content provider continues to operate. Otherwise, the flow proceeds to block 406.

At block 406, after the computing device of the content provider 1 202 determines that the content to be transmitted includes multiple instances of content to be automatically recorded, the computing device of the content provider multiplexes the multiple instances of content and the flow proceeds to block 407. At block 407, the computing device of the content provider scrambles the multiple instances of content utilizing the same control word. The flow then proceeds to block 408 where the computing device of the content provider transmits the scrambled and multiplexed multiple instances of content via the same frequency band of a broadcast. Next, the flow returns to block 402 where the computing device of the content provider continues to operate.

At block 409, after the computing device of the content provider 1 202 determines not to transmit content to the content receiver 201, the computing device of the content provider determines whether or not to transmit instructions to automatically record multiple instances of content to the content receiver. If not, the flow returns to block 402 and the computing device of the content provider continues to operate. Otherwise, the flow proceeds to block 410.

At block 410, after the computing device of the content provider 1 202 determines to transmit instructions to automatically record multiple instances of content to the content receiver 201, the computing device of the content provider signals the instructions and the flow proceeds to block 411. At block 411, the computing device of the content provider determines if content exists that is associated with the multiple instances of content. The flow then proceeds to block 412 where the computing device of the content provider determines whether or not associated content is available. If not, the flow returns to block 402 and the computing device of the content provider continues to operate. Otherwise, the flow proceeds to block 413.

At block 413, after the computing device of the content provider 1 202 determines that associated content is available, the computing device of the content provider determines whether or not to transmit supplemental instructions to the content receiver 201 to automatically record supplemental content. If not, the flow returns to block 402 and the computing device of the content provider continues to operate. Otherwise, the flow proceeds to block 414 where the computing device of the content provider transmits the supplemental instructions to the content receiver and the flow returns to block 402 where the computing device of the content provider continues to operate.

Returning to FIG. 2, in a first example, the content provider 1 202 may instruct the content receiver 201 to automatically record multiple instances of content, included in the same frequency band of a broadcast, corresponding to television programs broadcast by three of the four major television networks between the hours of seven PM and ten PM mountain time. The content provider 1 202 may desire to include such television programs broadcast by all four of the major television networks, but the same frequency band of the broadcast may not include sufficient capacity to include such television programs broadcast by all four of the major television networks. As such, the content provider 1 202 may transmit supplemental instructions specifying for the content receiver to record television programming aired by the fourth of the major television networks between the hours of seven PM and ten PM mountain time from a terrestrial broadcast source. Thus, subsequent to executing the instructions and the supplemental instructions, the content receiver may store all of the television programs broadcast by the four major television networks between the hours of seven PM and ten PM mountain time.

In a second example, the content provider 1 202 may instruct the content receiver 201 to automatically record multiple instances of content, included in the same frequency band of a broadcast, corresponding to television programs broadcast by the four major television networks between the hours of seven PM and ten PM mountain time. The content provider 1 202 may desire to also include television programs associated with a subchannel corresponding to one of the major four television networks for the above time period, but the content provider 1 202 may not have access to television programs associated with the subchannel. As such, the content provider 1 202 may transmit supplemental instructions specifying for the content receiver to record television programming aired associated with the subchannel during the time period mentioned above from a source where such television programs are available, such as a terrestrial broadcast source or an Internet source. Thus, subsequent to executing the instructions and the supplemental instructions, the content receiver may store the television programs broadcast by the four major television networks between the hours of seven PM and ten PM mountain time as well as the television programs associated with the subchannel for the same time period.

In a third example, the content provider 1 202 may instruct the content receiver 201 to automatically record multiple instances of content, included in the same frequency band of a broadcast, corresponding to television programs broadcast by the four major television networks between the hours of seven PM and ten PM mountain time. However, the versions of the multiple instances of content available via the content provider 1 202 may have a lower resolution than the versions of the same instances of content available via another source, such as a terrestrial broadcast source and/or an Internet source (which may be the content provider 2 204). As such, the

content provider 1 202 may transmit supplemental instructions specifying for the content receiver to record one or more versions of the multiple instances of content from the other source. The supplemental instructions in this example may be transmitted in response to one or more user requests received via the user interface component 210 of the content receiver.

As such, after executing the instructions and the supplemental instructions, the content receiver 201 may store the versions of the multiple instances of content recorded from the content provider 1 202 as well as one or more higher resolution versions of the multiple instances of content available from the other source. In some cases, the content receiver may overwrite one or more of the multiple instances of content recorded from the content provider 1 202 for which corresponding versions are recorded from the other source with the corresponding other version and/or otherwise delete the version recorded from the content provider 1 202.

In the present disclosure, the methods disclosed may be implemented as sets of instructions or software readable by a device. Further, it is understood that the specific order or hierarchy of steps in the methods disclosed are examples of sample approaches. In other embodiments, the specific order or hierarchy of steps in the method can be rearranged while remaining within the disclosed subject matter. The accompanying method claims present elements of the various steps in a sample order, and are not necessarily meant to be limited to the specific order or hierarchy presented.

The described disclosure may be provided as a computer program product, or software, that may include a non-transitory machine-readable medium having stored thereon instructions, which may be used to program a computer system (or other electronic devices) to perform a process according to the present disclosure. A non-transitory machine-readable medium includes any mechanism for storing information in a form (e.g., software, processing application) readable by a machine (e.g., a computer). The non-transitory machine-readable medium may take the form of, but is not limited to, a magnetic storage medium (e.g., floppy diskette, video cassette, and so on); optical storage medium (e.g., CD-ROM); magneto-optical storage medium; read only memory (ROM); random access memory (RAM); erasable programmable memory (e.g., EPROM and EEPROM); flash memory; and so on.

It is believed that the present disclosure and many of its attendant advantages will be understood by the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the components without departing from the disclosed subject matter or without sacrificing all of its material advantages. The form described is merely explanatory, and it is the intention of the following claims to encompass and include such changes.

While the present disclosure has been described with reference to various embodiments, it will be understood that these embodiments are illustrative and that the scope of the disclosure is not limited to them. Many variations, modifications, additions, and improvements are possible. More generally, embodiments in accordance with the present disclosure have been described in the context or particular embodiments. Functionality may be separated or combined in blocks differently in various embodiments of the disclosure or described with different terminology. These and other variations, modifications, additions, and improvements may fall within the scope of the disclosure as defined in the claims that follow.

## 11

The invention claimed is:

1. A television receiver configured to record supplemental content, the television receiver comprising:

one or more tuners;  
one or more processors; and

a memory communicatively coupled with and readable by the one or more processors and having stored therein processor-readable instructions which, when executed by the one or more processors, cause the one or more processors to:

receive one or more instructions, via a tuner of the one or more tuners, to record a content instance received via a broadcast communication link;

record, based on the one or more instructions, the content instance;

receive one or more supplemental instructions to record a supplemental content instance, wherein recording of the supplemental content instance is to occur via a second communication link; and

record, based on the one or more supplemental instructions, the supplemental content instance via the second communication link.

2. The television receiver configured to record supplemental content of claim 1, wherein:

the content instance received via the broadcast communication link is received from a first content provider; and the supplemental content instance received via the second communication link is received from a second content provider.

3. The television receiver configured to record supplemental content of claim 2, wherein:

the broadcast communication link is a satellite-based broadcast communication link; and

the second communication link is selected from the group consisting of:

a terrestrial broadcast communication link; and

an Internet protocol communication link.

4. The television receiver configured to record supplemental content of claim 3, wherein the content instance is part of a plurality of content instances that are each included in a same frequency band of a satellite broadcast, the processor-readable instructions which, when executed by the one or more processors, further causing the one or more processors to:

receive one or more instructions, via the tuner of the one or more tuners, to record the plurality of content instances received via the broadcast communication link; and

record, based on the one or more instructions, the plurality of content instances.

5. The television receiver configured to record supplemental content of claim 4, wherein each content instance of the plurality of content instances are concurrently scrambled using a same control word.

6. The television receiver configured to record supplemental content of claim 1, wherein the supplemental content instance is associated with the content instance.

7. The television receiver configured to record supplemental content of claim 1, wherein the processor-readable instructions which, when executed by the one or more processors, further causing the one or more processors to:

delete the recorded content instance after the supplemental content instance is recorded, wherein the recorded content instance and the recorded supplemental content instance are different instances of a same content.

8. The television receiver configured to record supplemental content of claim 2, wherein the supplemental content instance is not broadcast by the first content provider.

## 12

9. The television receiver configured to record supplemental content of claim 2, wherein the processor readable instructions which, when executed by the one or more processors, cause the one or more processors to record, based on the one or more supplemental instructions, the supplemental content instance via the second communication link are contingent on the content instance failing to be properly recorded.

10. A method for recording supplemental content, the method comprising:

receiving, by a television receiver, one or more instructions, via a tuner of the television receiver, to record a content instance received via a broadcast communication link;

recording, by the television receiver, based on the one or more instructions, the content instance;

receiving, by the television receiver, one or more supplemental instructions to record a supplemental content instance, wherein recording of the supplemental content instance is to occur via a second communication link; and

recording, by the television receiver, based on the one or more supplemental instructions, the supplemental content instance via the second communication link.

11. The method for recording supplemental content of claim 10, wherein:

the content instance received via the broadcast communication link is received from a first content provider; and the supplemental content instance received via the second communication link is received from a second content provider.

12. The method for recording supplemental content of claim 11, wherein:

the broadcast communication link is a satellite-based broadcast communication link; and

the second communication link is selected from the group consisting of:

a terrestrial broadcast communication link; and

an Internet protocol communication link.

13. The method for recording supplemental content of claim 12, wherein the content instance is part of a plurality of content instances that are each included in a same frequency band of a satellite broadcast, the method further comprising:

receiving, by the television receiver, one or more instructions, via the tuner of the television receiver, to record the plurality of content instances received via the broadcast communication link; and

recording, by the television receiver, based on the one or more instructions, the plurality of content instances.

14. The method for recording supplemental content of claim 13, wherein each content instance of the plurality of content instances are concurrently scrambled using a same control word.

15. The method for recording supplemental content of claim 10, wherein the supplemental content instance is associated with the content instance.

16. The method for recording of claim 1, further comprising

deleting, by the television receiver, the recorded content instance after the supplemental content instance is recorded, wherein

the recorded content instance and the recorded supplemental content instance are different instances of a same content.

17. The method for recording supplemental content of claim 11, wherein the supplemental content instance is not broadcast by the first content provider.

**13**

18. The method for recording supplemental content of claim 11, recording, based on the one or more supplemental instructions, the supplemental content instance via the second communication link is contingent on the content instance failing to be properly recorded.

19. A non-transitory processor-readable medium for recording supplemental content, comprising processor-readable instructions configured to cause one or more processors to:

receive one or more instructions, via a tuner of the one or more tuners, to record a content instance received via a broadcast communication link;

record, based on the one or more instructions, the content instance;

receive one or more supplemental instructions to record a supplemental content instance, wherein recording of the supplemental content instance is to occur via a second communication link; and

**14**

record, based on the one or more supplemental instructions, the supplemental content instance via the second communication link.

20. The non-transitory processor-readable medium of claim 19, wherein:

the content instance received via the broadcast communication link is received from a first content provider; the supplemental content instance received via the second communication link is received from a second content provider;

the broadcast communication link is a satellite-based broadcast communication link; and

the second communication link is selected from the group consisting of:

a terrestrial broadcast communication link; and an Internet protocol communication link.

\* \* \* \* \*